

## PATENT COOPERATION TREATY

PCT

REC'D 23 MAR 2006

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

## (PCT Article 36 and Rule 70)

Applicant's or agent's file reference E-2534/04	<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/IB2004/004197	International filing date (day/month/year) 15.12.2004	Priority date (day/month/year) 19.12.2003	
International Patent Classification (IPC) or national classification and IPC INV. B60J7/06 B60J7/047 B60J7/12			
Applicant FERRARI S.P.A. et al.			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 12 sheets, as follows:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the report</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>

Date of submission of the demand 27.09.2005	Date of completion of this report 22.03.2006
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer BORRAS GONZALEZ Telephone No. +49 89 2399-7071



# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/IB2004/004197

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

### Description, Pages

4-18 as originally filed  
1-3 filed with telefax on 27.09.2005

### Claims, Numbers

1-35 filed with telefax on 27.09.2005

### Drawings, Sheets

1/14-14/14 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
- 3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
- 4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos. 1
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-35
	No: Claims	
Inventive step (IS)	Yes: Claims	1-35
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-35
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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**To Chapter V.2.**

Reference is made to the following documents:

- D1: EP-A-1 260 394 (KARMANN GMBH) 27 November 2002 (2002-11-27)
- D2: DE 102 59 864 A1 (KARMANN GMBH) 15 July 2004 (2004-07-15)
- D3: DE 202 14 460 U1 (INALFA) 19 February 2004 (2004-02-19)
- D4: DE 195 31 074 C1 (WEBASTO) 12 September 1996 (1996-09-12)
- D5: DE 94 11 974 U1 (BAUER, ANTON) 23 November 1995 (1995-11-23)
- D6: US-A-5 897 160 (REIHL ET AL) 27 April 1999 (1999-04-27)
- D7: DE 101 30 267 A1 (WEBASTO) 9 January 2003 (2003-01-09)
- D8: US-A-2 794 672 (BURZI RICHARD) 4 June 1957 (1957-06-04)

**V.2.1. Independent Claim 1**

The amendments filed with the fax dated 27.09.05 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT, no support was found in the claims, description and/or drawings as filed.

The amendments concerned are the following:

"when the folding top (6) is in the open position, the closing body (16) of the hollow central portion (15) is in the position of disengagement so that the folding top (6) in the open position is c-shaped."

According to R. 70.2 (c) If the International Preliminary Examining Authority considers that any amendment goes beyond the disclosure in the international application as filed, the report shall be established as if such amendment had not been made, and the report shall so indicate.

**V.2.1.1. Novelty**

D1 describes:

- A motor vehicle provided with a folding top, which is supported by a frame of the motor vehicle, can be set in an open position or in a closed position, and comprises

an element of covering substantially horizontal in the closed position; the element of covering is hinged at the rear to the frame of the motor vehicle so that it can rotate about a first horizontal axis when the folding top passes from the open position to the closed position or viceversa; the element of covering is made up of two half-elements, which are connected together in such a way that one half-element of front covering is brought to rest on one half-element of rear covering when the folding top passes from the closed position to the open position; when the folding top is in the closed position, the two half-elements are substantially aligned with respect to one another, and, when the folding top is in the open position, the two half-elements are substantially set on top of one another.

Claim 1 differs therefrom in that

- the element of covering comprises a rigid outer frame, a hollow central portion surrounded by the outer frame, and a closing body, which is supported by the outer frame and is mobile between a position of engagement, in which it completely closes the central portion, and a position of disengagement, in which it leaves open at least one part of the central portion.

Therefore, the subject-matter of the present claim 1 seems to fulfil the provisions of Art. 33 (2) PCT (Novelty) in view of the state of the art as mentioned in the search report.

#### V.2.1.2. Inventive Step

The problem to be solved by the present invention may therefore be regarded as to provide a rigid folding top for a vehicle with an engine housed in the rear part. The features of the characterizing portion of claim 1 are not contained in or does not seem to be rendered obvious from the state of the art as mentioned in the search report.

The present claim 1 seems therefore to fulfil the provisions of Art 33 (3) PCT.

#### V.2.2. Dependent Claims 2-35

Claims 2-35 depending on claim 1 and having as subject-matter special and advantageous embodiments of the invention according to claim 1 seem, together with its subject-matter,

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(SEPARATE SHEET)**

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to fulfil the provisions of Art. 33 and Rule 6 PCT.

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A MOTOR VEHICLE PROVIDED WITH A FOLDING TOP

TECHNICAL FIELD

The present invention relates to a motor vehicle  
5 provided with a folding top.

BACKGROUND ART

There have always been present on the automobile market  
motor vehicles equipped with folding tops that can be  
10 unfolded to assume a closed position, in which the  
folding top covers the entire passenger compartment of  
the motor vehicle to enable use of the motor vehicle in  
the case of bad weather and/or cold, and can be folded  
to assume an open position, in which substantially the  
15 entire passenger compartment of the motor vehicle is  
uncovered. In the past, folding tops of the type  
described above had always been made of canvas, which is  
folded on itself in bellows fashion when the folding top  
assumes the open position. A folding top made of canvas  
20 is simple and inexpensive to produce, but also presents  
various drawbacks, in so far as the canvas tends to age  
quite rapidly above all when it is exposed to inclement  
weather conditions and to sunlight, and hence frequently  
the useful life of a folding top made of canvas is  
25 relatively short. Furthermore, canvas does not afford a  
good acoustic insulation, and hence the passenger  
compartment is particularly noisy also when the folding  
top is in the closed position. In addition, canvas tends  
to get deformed and to vibrate in a noisy way when the  
30 motor vehicle travels at relatively high speeds.  
Finally, canvas does not provide sufficient security in  
so far as it can easily be cut just with a knife by an

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ill-intentioned person who wishes to gain access to the inside of the motor vehicle.

For the reasons set forth above, there have recently been proposed motor vehicles provided with a rigid folding top made of sheet metal, said folding top normally being made up of two or more rigid elements made of sheet metal hinged together and designed to fold onto one another to pass from the closed position to the open position. In particular, one element defines a roof of the passenger compartment and delimits the passenger compartment at the top, whilst the other element defines a rear window and delimits the passenger compartment at the rear. However, a rigid folding top of the type described above presents some drawbacks in so far as, in the folded position, it presents large overall dimensions that may prove incompatible with the characteristics of some types of vehicles and particularly with vehicles having the engine housed in a central or rear position.

EP1260394A2 discloses a convertible vehicle with at least one flexible roof part; the flexible roof area has a cover stretched over rigid supports inbetween frame supports at the sides of the vehicle. At least a part of the supports run in the longitudinal direction of the vehicle; each support includes one articulated joint so that the roof can be folded around this joint.

DE19531074A1 discloses a motor vehicle with collapsible hood and tailgate; the vehicle has a pivot axis, to move the hood from closed to open position, which is positioned coaxially to a pivot axis for the tailgate. The hood has two longitudinal roof-fastened guide arms, which are connected by a hinge and are located in front

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of the pivot axis in direction of travel. The front guide arms are connected near the front ends by a transverse windshield, and an intermediate shield between the first shield and the hinge; the rear guide arms are also connected by an intermediate shield, which is fastened so as to be turnable.

DISCLOSURE OF INVENTION

10 The purpose of the present invention is to provide a motor vehicle equipped with a folding top, which will be easy and inexpensive to produce and will, at the same time, be free from the drawbacks described above.

15 In accordance with the present invention, a motor vehicle is provided equipped with a folding top as recited in the attached Claims.

BRIEF DESCRIPTION OF THE DRAWINGS

20 The present invention will now be described with reference to the annexed drawings, which illustrate some non-limiting examples of embodiment thereof, in which:

- Figure 1 illustrates a perspective and schematic view of a motor vehicle produced according to the teachings of the present invention and equipped with a folding top set in a closed position;
- Figures 2-5 illustrate some perspective views of the motor vehicle of Figure 1 during successive steps of opening of the folding top and with the removal of some parts for reasons of clarity;
- Figure 6 illustrates a perspective view of the motor vehicle of Figure 1 with the folding top set in an open position;
- Figure 7 illustrates a perspective view of a

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## C L A I M S

1) A motor vehicle (1) provided with a folding top (6), which is supported by a frame (5) of the motor vehicle (1), can be set in an open position or in a closed position, and comprises an element (7) of covering substantially horizontal in the closed position; the element (7) of covering is hinged at the rear to the frame (5) of the motor vehicle (1) so that it can rotate about a first horizontal axis (8) when the folding top (6) passes from the open position to the closed position or vice versa; the element (7) of covering is made up of two half-elements (11, 12), which are connected together in such a way that one half-element (11) of front covering is brought to rest on one half-element (12) of rear covering when the folding top (6) passes from the closed position to the open position; when the folding top (6) is in the closed position, the two half-elements (11, 12) are substantially aligned with respect to one another, and, when the folding top (6) is in the open position, the two half-elements (11, 12) are substantially set on top of one another;

the motor vehicle (1) is characterized in that the element (7) of covering comprises a rigid outer frame (14), a hollow central portion (15) surrounded by the outer frame (14), and a closing body (16), which is supported by the outer frame (14) and is mobile between a position of engagement, in which it completely closes the central portion (15), and a position of disengagement, in which it leaves open at least one part of the central portion (15); when the folding top (6) is in the open position, the closing body (16) of the

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hollow central portion (15) is in the position of disengagement so as the folding top (6) in the open position is C-shaped.

5 2) The motor vehicle (1) according to Claim 1, wherein the element (7) of covering has at the rear two appendages, which are set perpendicular to the element (7) of covering, are substantially vertical in the closed position, and are hinged to the frame (5) in a 10 position corresponding to their free ends.

15 3) The motor vehicle (1) according to Claim 1 or 2, wherein, when the folding top (6) passes from the open position to the closed position or vice versa, the element (7) of covering performs a rotation through approximately 180° about the first horizontal axis (8) with respect to the frame (5) of the motor vehicle (1).

20 4) The motor vehicle (1) according to Claim 1, 2 or 3, wherein the two half-elements (11, 12) are hinged together so as to rotate with respect to one another about a second horizontal axis (13) parallel to the first axis (8); when the folding top (6) passes from the open position to the closed position or vice versa, the 25 half-element (11) of front covering rotates with respect to the half-element (12) of rear covering about the second horizontal axis (13).

30 5) The motor vehicle (1) according to Claim 4, wherein when the folding top (6) passes from the open position to the closed position or vice versa the half-element (11) of front covering performs a rotation substantially

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of 180° about the second horizontal axis (13) with respect to the half-element (12) of rear covering.

6) The motor vehicle (1) according to Claim 4 or 5,  
5 wherein the half-element (11) of front covering is connected to the half-element (12) of rear covering in such a way that a top surface of the half-element (11) of front covering rests on a top surface of the half-element (12) of rear covering.

10 7) The motor vehicle (1) according to Claim 4 or 5, wherein the half-element (11) of front covering is connected to the half-element (12) of rear covering in such a way that a bottom surface of the half-element 15 (11) of front covering rests on a bottom surface of the half-element (12) of rear covering.

20 8) The motor vehicle (1) according to Claim 4, wherein the two half-elements (11, 12) are connected together in such a way that the half-element (11) of front covering performs a translation or a rototranslation to set 25 itself on top of the half-element (12) of rear covering.

9) The motor vehicle (1) according to Claim 8, wherein 25 the two half-elements (11, 12) are connected together in such a way that the half-element (11) of front covering performs a translation or a rototranslation or rotation to set itself on top of the half-element (12) of rear covering.

30 10) The motor vehicle (1) according to Claim 8 or 9, wherein the half-element (11) of front covering is

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connected to the half-element (12) of rear covering in such a way that a top surface of the half-element (11) of front covering rests, by means of a translation or a rototranslation or rotation, on a bottom surface of the 5 half-element (12) of rear covering.

11) The motor vehicle (1) according to Claim 8 or 9, wherein the half-element (11) of front covering is connected to the half-element (12) of rear covering in 10 such a way that a bottom surface of the half-element (11) of front covering rests, by means of a translation or a rototranslation, on a top surface of the half-element (12) of rear covering.

15 12) The motor vehicle (1) according to Claim 9, 10 or 11, wherein the half-element (11) of front covering is connected to the half-element (12) of rear covering by means of a pair of deformable quadrilaterals (31).

20 13) The motor vehicle (1) according to Claim 12, in which the half-elements (11, 12) of covering comprise a substantially horizontal central portion (29), delimited laterally by a pair of substantially vertical side portions (30); each deformable quadrilateral (31) 25 comprising a first hook-shaped arm (32), which has one end hinged to the side portion (30) of the half-element (12) of rear covering so that it can rotate about a third substantially horizontal axis (33) and one opposite end hinged to the side portion (30) of the half-element (11) of front covering so that it can rotate about a fourth substantially horizontal axis (34), a second L-shaped arm (35), which has one end 30

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hinged to the side portion (30) of the half-element (11) of rear covering so that it can rotate about a fifth substantially horizontal axis (36) and one opposite end hinged to the end of a third arm (37) so that it can 5 rotate about a sixth substantially horizontal axis (38); at the other end, the third arm (37) being hinged both to the hook-shaped arm (32) and to the side portion (30) of the half-element (11) of front covering so that it can rotate about the fourth axis (34).

10 14) The motor vehicle (1) according to any one of Claims 1 to 13, wherein the outer frame (14) surrounds the central portion (15) substantially on three sides.

15 15) The motor vehicle (1) according to any one of Claims 1 to 13, wherein the outer frame (14) surrounds completely the central portion (15) on four sides.

16) The motor vehicle (1) according to any one of Claims 20 1 to 15, wherein the closing body (16) is deformable so as to pass from a distended configuration corresponding to the position of engagement to a gathered-up configuration corresponding to the position of disengagement.

25 17) The motor vehicle (1) according to Claim 16, wherein the closing body (16) comprises a flexible canvas (17), which is slidably mounted on two side members (18) of the outer frame (14) to slide between the position of 30 engagement and the position of disengagement.

18) The motor vehicle (1) according to Claim 17, wherein

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a front portion of the canvas (17) is mounted on a pair of first slides (19), each of which is slidably mounted along a respective side member (18) of the outer frame (14).

5

19) The motor vehicle (1) according to Claim 16, wherein the closing body (16) is of a plate-like type and comprises a set of rigid plates (20), which are hinged in a slidable way on two side members (18) of the outer frame (14) to slide between the position of engagement, in which the plates (20) are set horizontally alongside one another, and the position of disengagement, in which the plates (20) are set in a substantially vertical position packed on top of one another.

15

20) The motor vehicle (1) according to Claim 19, wherein each plate is mounted on a pair of second slides (21), each of which is slidably mounted along a respective side member (18) of the outer frame (14).

20

21) The motor vehicle (1) according to any one of Claims 16 to 20, wherein the closing body (16) is slidably mounted on two side members (18) of the outer frame (14); each side member comprising both a first seat (22) designed to be engaged by a number of first slides (18) supporting a flexible canvas (17), and a second seat (23) designed to be engaged by a number of second slides (21) supporting a set of rigid plates (20).

30 22) The motor vehicle (1) according to any one of Claims 1 to 15, wherein the closing body (16) comprises at least one fixed panel (39) and at least one mobile panel

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(39), which is designed to slide underneath the fixed panel (39).

5 23) The motor vehicle (1) according to Claim 22, wherein the closing body (16) comprises a single fixed panel (39) set in a rear position and a single mobile panel (39), which is set in a front position and is designed to slide underneath the fixed panel (39).

10 24) The motor vehicle (1) according to Claim 22, wherein the closing body (16) comprises two fixed panels (39), one set in a front position and one a rear position and two mobile panels (39) set in a central position; each mobile panel (39) is designed to slide underneath a 15 respective fixed panel (39).

20 25) The motor vehicle (1) according to Claim 22, wherein the closing body (16) comprises a set of fixed panels (39) and a set of mobile panels (39); a single mobile panel (39) is designed to slide underneath a 25 corresponding fixed panel (39).

26) The motor vehicle (1) according to Claim 22, wherein the closing body (16) comprises a set of fixed panels 25 (39) and a set of mobile panels (39); a number of mobile panels (39) are designed to slide underneath one and the same corresponding fixed panel (39).

27) The motor vehicle (1) according to any one of Claims 30 1 to 26, wherein the frame (5) comprises a pair of vertical uprights (9), which are set on opposite sides of a passenger compartment (2), carry hinged thereto the

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element (7) of covering, and perform the function of roll-bar in the event of the motor vehicle (1) itself turning over.

5 28) The motor vehicle (1) according to any one of Claims 1 to 27, wherein at the rear of the point of hinging of the element (7) of covering there is made a housing (24), which is supported by the frame (5) and is closed by a respective lid (25), hinged so as to rotate with 10 respect to the frame (5) about a seventh horizontal axis (26) parallel to the first axis (8).

29) The motor vehicle (1) according to Claim 28, wherein the frame (5) supports a rear engine compartment (3), 15 which has a top lid (4); the housing (24) being C-shaped and set around the top lid (4) of the engine compartment (3).

30) The motor vehicle (1) according to Claim 29, wherein 20 the top lid (4) of the engine compartment (3) is transparent.

31) The motor vehicle (1) according to Claim 28, 29 or 25 30, wherein the frame (5) comprises a pair of vertical uprights (9), which are set on opposite sides of a passenger compartment (2) and carry hinged thereto the element (7) of covering; the lid (25) of the housing (24) comprising two vertical fins (27), set laterally on opposite sides of the lid (25) and designed to rest on 30 the vertical uprights (9) of the frame (5) when the lid (25) is in a closed position.

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32) The motor vehicle (1) according to any one of Claims 1 to 31, wherein there is provided a transparent plane panel (28), which is set substantially vertical and defines a rear window.

5

33) The motor vehicle (1) according to Claim 32, wherein the transparent panel (28) is mounted so as to displace parallel to itself in a substantially vertical direction between an extracted position, in which the transparent panel (28) comes out of the bodywork, and a retracted position, in which the transparent panel (28) is housed inside the bodywork in a respective seat.

34) The motor vehicle (1) according to any one of Claims 1 to 33, wherein said first horizontal axis (8) is a fixed axis.

35) The motor vehicle (1) according to any one of Claims 1 to 35, wherein said first horizontal axis (8) is a mobile axis.